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Adherence to treatment in chronic kidney disease: associations with therapeutic modalities and coping capacity

Adesão ao tratamento na doença renal crônica: associações com as modalidades terapêuticas e capacidade de enfrentamento

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Abstract

Objective
Chronic kidney disease treatment requires renal replacement therapy, with two possibilities - hemodialysis or peritoneal dialysis. Due to physical and psychosocial stressors, adherence to treatment becomes a challenge. Coping strategies play a mediating role between patients, health, and the disease. This study aimed to identify potential associations between the level of adherence to dialysis treatment, therapeutic modalities, and types of coping used.

Method
A quantitative study was conducted with a non-probabilistic sample of 233 patients who responded to four instruments, analyzed through descriptive and inferential statistics.

Results
Were observed higher levels of adherence in attitudes towards social restrictions in peritoneal dialysis patients, and that both groups use different coping strategies. There are associations between confrontational and supportive coping and therapeutic adherence.

Conclusion
Subjects on peritoneal dialysis have a better attitude towards therapeutic adherence, highlighting the need for greater investment in this treatment.

Keywords: Adaptation, psychological; Renal insufficiency, chronic; Treatment adherence and compliance.

Resumo

Objetivo
A doença renal crônica exige, no tratamento, a realização de terapia renal substitutiva, com duas possibilidades – hemodiálise ou diálise peritoneal. Devido a estressores físicos e psicossociais, a adesão ao tratamento torna-se um desafio. As estratégias de enfrentamento têm papel mediador entre paciente, saúde e doença. O presente estudo objetivou identificar possíveis associações entre o nível de adesão ao tratamento dialítico, modalidades terapêuticas e tipos de enfrentamento utilizados.

Método
Realizou-se uma pesquisa quantitativa, com amostra não probabilística de 233 pacientes, que responderam quatro instrumentos, analisados por meio de estatística descritiva e inferencial.

Resultados
Observou-se melhores índices na adesão de atitudes frente às restrições sociais nos pacientes em diálise peritoneal, e que os grupos utilizam diferentes estratégias de enfrentamento. Há associações entre enfrentamentos confrontivo e sustentativo, e adesão terapêutica.

Conclusão
Sujeitos em diálise peritoneal possuem melhor atitude frente à adesão terapêutica, alertando sobre a necessidade de maior investimento nesse tratamento.

***Palavras-chave**: Adaptação psicológica; Insuficiência renal crônica; Cooperação e adesão ao tratamento.*

The increase in chronic-degenerative diseases and the continuous advancement in biotechnology have significantly influenced healthcare (I. Q. Pedroso et al., 2022). Regarding diseases for which there is still no cure, demands are imposed to increase survival rates and provide patients with quality of life by offering alternatives that enhance coping with the challenges arising from the disease and adherence to its treatment (Amaral et al., 2021; Contente et al., 2018).

Chronic Kidney Disease (CKD), defined as abnormalities in kidney function present for more than three months - the estimated time to identify the chronicity of the disease and the impossibility of restoring kidney function (Carvalho et al., 2023; Çelakıl & Çoban, 2022; Gomes et al., 2019), is a challenging condition. It demands the creation of therapeutic solutions that are easy to adhere to for 126,583 patients in Brazil (Thomé et al., 2019). However, CKD is among the most neglected non-communicable diseases globally (Samaan et al., 2022).

Treatment is carried out through two different modalities of Renal Replacement Therapy (RRT), which differ in how they affect patients' lives: Hemodialysis (HD) or Peritoneal Dialysis (PD) (Feijão & Melo, 2020). Each of them has its characteristics, but both have a common factor, the dependence on the machine until a kidney transplant is performed (Oliveira et al., 2019; V. F. C. Santos et al., 2018; Souza et al., 2018).

Hemodialysis is the therapy used by 93.1% of patients with CKD in Brazil (Thomé et al., 2019). It is performed in specialized clinics, three times a week, with a mean duration of four hours per session (Pereira & Ferreira, 2022; V. F. C. Santos et al., 2018). PD, on the other hand, is used by only 6.9% of patients with CKD. Through a catheter implanted in the patient's peritoneum, installed through surgery, a dialysis fluid is injected, which remains in the abdomen (peritoneum) for 4 to 6 hours and is then drained. It can be done in a clinic/hospital or the patient's home (V. S.

M. Pedroso et al., 2018). However, its utilization remains limited due to various factors, such as a scarcity of health policies addressing this treatment, its high cost, the need for appropriate home environment conditions, a shortage of machines, and a dearth of specialized professionals in this modality of RRT. These constraints result in minimal support or encouragement for the adoption of this treatment (Feijão & Melo, 2020; Feijão et al., 2024).

However, this modality can be a more advantageous treatment option for several reasons: it is less aggressive, requires the patient to have more knowledge about the procedures to be performed, offers greater autonomy and a better quality of life since the machine is in their home, among other factors. On the other hand, there are also negative impacts on the lives/routines of patients undergoing PD, such as greater distance between the patient and the healthcare team, as they only meet during review appointments, usually once a month (Gomes et al., 2019; Oliveira, 2016).

Throughout this process, regardless of the modality used, dialysis treatment is typically rigorous and invasive for both patients and their families. It imposes significant changes in their routines, habits, and lifestyles, creating physical and psychosocial stressors. It requires dedication to adhere to dietary and fluid restrictions and the administration of medication at specific times. It can lead to changes in body appearance, fatigue, skin and/or mucous membrane itching, loss of financial and social autonomy due to necessary work absences and/or the high cost of treatment in private clinics, reduced social and recreational activities, changes in family dynamics/routines, as well as significant psychological suffering due to the limitations endured, uncertainty about the future, sleep disturbances, and a fear of being alone (Cargnin et al., 2018). Patients may also experience a sense of identity loss, as they become known as "the patient with CKD," which can lead to uncertainty and frustration (Gomes et al., 2019).

Due to all these stressors, treatment can be characterized by the ambivalent feelings of patients who, on the one hand, recognize the importance of treatment as it provides them with some autonomy to continue living until they get a kidney transplant, but on the other hand, they feel tied to a machine (V. F. C. Santos et al., 2018). Amid this ambivalence, adherence to CKD treatment becomes a challenge for patients, their families, and professionals, deserving constant monitoring (Lins et al., 2018). Adherence is understood as a multidetermined, dynamic process of shared responsibility between the patient and the healthcare team, wherein the focus goes beyond the patient's mere compliance with medical advice (Feijão & Melo, 2020; Polejack & Seidl, 2010). It is a significant and global challenge in the context of healthcare; its understanding should encompass wide range of behaviors, as well as socio-economic and cultural aspects that pertain to the treatment process, the disease, the institution, the patient, and the relationship with healthcare professionals (Carvalho, 2019).

The limitations imposed by CKD and its treatment require patients to employ coping mechanisms to create positive attitudes toward the disease and adherence to treatment (V. F. C. Santos et al., 2018; Siqueira et al., 2019). In this context, coping strategies play a mediating role between individuals, their health, and the disease. Coping, according to the interactive stress model, refers to a set of cognitive and behavioral strategies used to manage internal or external demands, assessed as a burden on an individual's personal resources (Folkman & Lazarus, 1988).

According to this model, coping strategies have been categorized into two categories concerning their function. Problem-focused coping involves a person's engagement in problem modification, aiming to control the threat or challenge through active strategies that approach the stressor, such as problem-solving. The primary function of emotion-focused coping is to regulate the emotional response caused by the stressor/problem the person is facing, potentially involving

distancing from the source of stress, such as avoidance or denial, which may be associated with poorer levels of mental health (Folkman & Lazarus, 1988; Seidl et al., 2001).

These strategies are not mutually exclusive, as an individual can use different coping strategies simultaneously in a given stressful situation (Seidl et al., 2001). The choice of the type of strategy to be used depends not only on social and personal aspects but is also related to the type of problem faced (Lazarus & Folkman, 1984), which, in the case of this study, includes issues arising from CKD and its treatment.

In different studies, patients with CKD report using various coping strategies, such as seeking entertainment, social support, engaging in spirituality/religiosity, individual or group psychotherapy, and relying on a support network (Cargnin et al., 2018; Castro et al., 2018; V. F. C. Santos et al., 2018; Siqueira et al., 2019). Coping also arises in the construction of a common identity among patients, turning them into a community during dialysis sessions. Here, they are all equal in the face of the disease, despite differences in economic status, age, education, among other factors (Cargnin et al., 2018; Castro et al., 2018; V. F. C. Santos et al., 2018). Patients will seek, within their capabilities, the coping strategies that best suit them, mediating between themselves and their disease, helping in their adaptation to CKD and adherence to treatment (Gomes et al., 2019).

Based on these concepts, it is necessary to unveil the specificities and associations between therapeutic modalities of RRT, coping strategies used, and adherence to treatment in individuals with chronic kidney disease. In response to this demand, this research aims to identify possible associations between therapeutic modalities and types of coping used by individuals with CKD and the level of adherence to dialysis treatment. More specifically, it aims to (1) identify the types of coping and the level of treatment adherence in people with CKD; (2) compare the coping strategies used and the level of adherence to treatment between chronic kidney patients on HD and those who undergo PD; and (3) examine possible correlations between the coping strategies used and adherence to dialysis treatment.

The relevance of this paper is justified by the expansion of knowledge on the subject, providing scientific data to guide the planning of effective strategies aimed at creating incentives for better patient care and adaptation to the disease and treatment, as well as for the development of public policies in this field. Its importance lies in the magnitude of the problem, but also in filling a gap in the literature by comparing the two modalities of RRT (HD and PD), thus providing greater insight into PD.

Method

A quantitative, descriptive, and correlational approach was employed in this research. The present study was approved by the Research Ethics Committee, under opinion number 2393803. The bioethical recommendations for research involving human subjects, as outlined in Resolution 466/2012 of the Conselho Nacional de Saúde (CNS, National Health Council), were adhered to, and informed consent was obtained through the signing of the Informed Consent Form (ICF).

Participants

A convenience, non-probabilistic sample comprising 233 patients from the three main public and private dialysis units in the state of Ceará (Brazil) was utilized. Inclusion criteria were defined as individuals diagnosed with CKD undergoing HD or PD treatment, aged over 18 years, of both sexes, and on treatment for more than 90 days, an estimated time for the identification of

the disease's chronicity and treatment (Contente et al., 2018). Individuals with special needs or any disabilities that would hinder the comprehension and response to the instruments were excluded.

Among the sociodemographic data, it was observed that the participants had a mean age of 50.75 years (*SD* = 17.59). Most of them were male (*n* = 125; 53.60%), had children (*n* = 167; 72.9%), identified themselves as Catholic (*n* = 140; 60.10%), and received some form of financial assistance from the government (*n* = 145; 63.3%). On average, they had been diagnosed with CKD for 7.23 years (*SD* = 8.88) and had been receiving treatment for 4.22 years (*SD* = 4.65). Out of the total sample, 183 patients (78.5%) reported undergoing HD, and 50 (21.5%) reported being on PD treatment.

Instruments

Four instruments were used to collect data. In addition to a Sociodemographic and Clinical Data Questionnaire, the Jalowiec Coping Scale (Jalowiec et al., 1984) was employed. This scale, based on Lazarus and Folkman's (1984) theoretical model, allows for the identification of two types of coping (problem-focused or emotion-focused) and eight subtypes of coping strategies (confrontive, evasive, optimistic, fatalistic, emotional, palliative, sustaining, and self-reliant).

Two adherence scales were also used, originally developed by Rushe and Macgee (1998), with cross-cultural adaptation by Machado et al. (2015). The Renal Adherence Attitudes Questionnaire (RAAQ) is used to assess patients' attitudes towards dietary and fluid restrictions in CKD and how these restrictions affect their lives, covering four factors: Attitudes towards social restrictions (α = 0.88), Attitudes towards well-being (α = 0.77), Attitudes towards self-care and family support (α = 0.68), and Acceptance (α = 0.86). The Renal Adherence Behavior Questionnaire (RABQ) assesses self-reported adherence based on patients' behavior concerning restrictions on phosphorus, potassium, sodium, fluid intake, and medication use, consisting of five factors: Adherence to fluid restrictions (α = 0.80), Adherence to potassium and phosphorus restrictions and medication use (α = 0.70), Adherence to self-care (α = 0.78), Adherence during challenging times (α = 0.56), and Adherence to sodium intake (α = 0.68).

Procedures

Participants were approached during HD sessions and in the waiting room of their monthly appointments as PD patients. The research objectives and procedures were explained to them. After reviewing the inclusion criteria and accepting the invitation to participate, they orally and individually completed the four instruments in a single session, which had a mean duration of 40 minutes.

Data were analyzed in four stages using the IBM®SPSS® (version 22). Initially, the data obtained from the sociodemographic and clinical characterization questionnaire were described.

In the second stage, the scores obtained on the Jalowiec Coping Scale and the Adherence Scales (RAAQ and RABQ) were described. To analyze coping, the sum of items selected within each coping subtype was calculated, generating a percentage of positive responses in that subtype. Subsequently, it was determined which subtype(s) the participant selected 50% or more of the items in; among these, the participant was classified in the subtype(s) with the highest score (there could be more than one subtype in the case of a tie). If a participant did not score at least 50% in any subtype, they were not classified into any coping subtype. For the analysis of the Adherence Scales (RAAQ and RABQ), the means, standard deviations, minimum and maximum scores for the overall scale score and for each of the factors were obtained. Then, the sample score mean

was checked to see if it was above or below the "midpoint" [(minimum possible + maximum possible)/2]. To interpret these data, the obtained scores were analyzed based on a quartile distribution (Table 1).

Table 1
Distribution of scores in quartiles of the Renal Adherence Attitudes Questionnaire and Renal Adherence Behavior Questionnaire and their factors

Factors	RAAQ scores distribution				RABQ scores distribution			
	Poor	Fair	Good	Excellent	Poor	Fair	Good	Excellent
Total	26-52	53-78	79-104	105-130	25-50	51-75	76-100	101-125
F1	8-16	17-24	25-32	33-40	11-22	23-33	34-44	45-55
F2	11-22	23-33	34-44	45-55	5-10	11-15	16-20	21-25
F3	4-8	9-12	13-16	17-20	2-4	5-6	7-8	9-10
F4	11-22	23-33	34-44	45-55	5-10	11-15	16-20	21-25
F5	-	-	-	-	2-4	5-6	7-8	9-10

Note: RAAQ: Renal Adherence Attitudes Questionnaire; RABQ: Renal Adherence Behavior Questionnaire.

In the third stage of data analysis, sample score comparison tests were conducted for both constructs between patients undergoing HD and PD (using tests selected based on the normality distribution). In the fourth stage, correlation analyses were performed between the two constructs studied using the Spearman correlation coefficient for non-parametric data at a significance level below 5% ($p < 0.05$).

Results

Coping strategies of patients with Chronic Kidney Disease

In the results concerning the Jalowiec Coping Scale, there was a predominance of emotion-focused coping (f = 104; 44.64%), followed by problem-focused coping (f = 87; 37.34%). The eight different coping subtypes (confrontive, evasive, fatalistic, optimistic, palliative, emotional, supportive, and self-reliant) were identified among the participants. Among these subtypes, there was a predominance of the "optimistic" subtype, indicating the use of optimistic thoughts, mental processing, and positive comparisons when facing a problem. This was followed by the "palliative" subtype (f = 82; 27.90%), suggesting a tendency to relativize problems and reduce their importance, and the "self-reliant" subtype (f = 42; 14.30%), indicating a tendency to confront the problem on one's own, without the help of others. Both subtypes are emotion-focused (Table 2).

Table 2
Coping subtypes used by Chronic Kidney Disease patients

Coping Subtypes	Items (n)	Frequency	%	Sample – mean (n = 233)	Sample – Standard deviation (n = 233)
Confrontive	10	41	13.90	5.66	2.98
Sustaining	5	3	1.00	3.14	1.42
Evasive	13	11	3.70	5.90	2.89
Fatalistic	4	9	3.10	1.05	1.04
Optimistic	9	99	33.70	6.38	2.25
Palliative	7	82	27.90	2.24	1.35
Emotional	5	7	2.40	1.42	1.03
Self-reliant	7	42	14.30	3.98	1.96
Total	60	294*	100.0%	30.93	10.87

Note: *The total number of subjects in the sum of coping subtypes is greater than the total sample number because some subjects were classified in more than one subtype.

Patient Adherence with Chronic Kidney Disease

Chronic Kidney Disease patients' attitudes toward adherence

The analysis of RAAQ scores, which assesses patients' attitudes towards dietary and fluid restrictions and how these affect their lives, yielded a total mean score of 89.95 (*SD* = 9.67), indicating a "good attitude" based on quartile distribution. It was found that 87.8% of the participants (*f* = 194) scored above the midpoint of the overall RAAQ scores, indicating that these individuals had a good level of attitude toward adherence. Similarly, all four of its factors were considered good (Table 3). These data suggest good social adaptation, physical well-being, and an ability to appreciate the benefits of adhering to dietary restrictions, self-care, as well as the importance of family and friends in maintaining the diet. Lastly, their acceptance of restrictions and the impact on the lifestyle.

Table 3
Chronic Kidney Disease patients' attitudes toward adherence based on Renal Adherence Attitudes Questionnaire data and factors

Factors	*N*	Minimum possible	Mean point	Maximum possible	Minimum obtained	Maximum obtained	*M*	*SD*
Total	221	26	78	130	61	114	89.95	9.67
F1	228	8	24	40	9	36	25.60	4.88
F2	224	11	33	55	25	51	39.83	4.53
F3	230	4	12	20	6	20	14.60	2.62
F4	226	11	24	55	20	49	35.96	5.36

Note: Total: Total RAAQ score; F1: Attitudes toward social restrictions; F2: Attitudes toward well-being; F3: Attitudes toward self-care/support; F4: Acceptance; RAAQ: Renal Adherence Attitudes Questionnaire; M: Media; SD: Standard Deviation.

Chronic Kidney Disease patients' behavior toward adherence

The analysis of RABQ scores, which is used to assess patient behavior towards restrictions related to phosphorus, potassium, sodium, fluid, and medication use, resulted in a mean score of 84.4 (*SD* = 7.44), indicating "good adherence" based on quartile distribution. It was found that 86.6% (*f* = 187) of the participants scored above the midpoint of total RABQ scores, indicating that participants had a good level of behavior toward adherence. Additionally, factors 1, 3, and 4 were classified as "good adherence," while factors 2 and 5 were considered "poor adherence" (Table 4).

Table 4
Chronic Kidney Disease patients' attitudes toward adherence according to Renal Adherence Behavior Questionnaire data and factors

Factors	*N*	Minimum possible	Mean point	Maximum possible	Minimum obtained	Maximum obtained	*M*	*SD*
Total	216	25	75	125	65	101	84.43	7.44
F1	225	11	33	55	24	47	37.51	4.92
F2	230	5	15	25	8	21	15.58	1.96
F3	231	2	6	10	3	10	8.38	1.52
F4	224	5	15	25	10	23	17.87	2.57
F5	229	2	6	10	2	9	5.21	1.17

Note: Total: total RABQ score; F1: Adherence to fluid restriction; F2: Adherence to potassium and phosphorus restrictions and prescribed medication use; F3: Self-care; F4: Adherence in times of particular difficulty; F5: Adherence to sodium restrictions; M: Media; SD: Standard Deviation.

Sample Comparison Between Hemodialysis and Peritoneal Dialysis Patients

Comparison of Coping Styles Between Hemodialysis and Peritoneal Dialysis

Statistically significant differences were observed between the two groups of patients in the scores of the various coping subtypes. HD patients scored higher in confrontive coping ($U = 3287.50$; $p < 0.05$), evasive coping ($U = 2525.50$; $p < 0.05$), optimistic coping ($U = 1972.00$; $p < 0.05$), emotional coping ($U = 3617.00$; $p < 0.05$), palliative coping ($U = 3100$; $p < 0.05$), supportive coping ($U = 3521.00$; $p < 0.05$), and fatalistic coping ($U = 3622.00$; $p < 0.05$). Patients undergoing PD scored higher in self-reliant coping ($U = 2517.00$; $p < 0.05$).

Comparison of Adherence Attitudes Between Hemodialysis and Peritoneal Dialysis Patients

When comparing RAAQ scores, a statistically significant difference was found in Factor 1, "Attitudes towards social restrictions" ($U = 3186.50$; $p = 0.008$) between the two groups. Patients treated with PD ($M = 26.89$; $SD = 5.28$; $MD = 28$) had higher scores than patients undergoing HD ($M = 25.26$; $SD = 4.72$; $MD = 26$). No statistically significant differences were found in the other factors: RAAQ Factor 2, "Attitudes towards well-being" ($p = 0.58$); RAAQ Factor 3, "Attitudes towards self-care/support" ($p = 0.06$); and RAAQ Factor 4, "Acceptance" ($p = 0.11$). Regarding the overall scale score, which is the sum of all the questionnaire items, there was no statistically significant difference between HD and PD patients ($p = 0.18$).

Comparison of Adherence Behavior Between Hemodialysis and Peritoneal Dialysis Patients

Regarding RABQ, which is used to assess patients' behavior regarding restrictions related to potassium, phosphorus, sodium, fluid, and medication use, no statistically significant difference was found between HD and PD patients in any of the factors: RABQ Factor 1 ($p = 0.85$), RABQ Factor 2 ($p = 0.64$), RABQ Factor 3 ($p = 0.17$), RABQ Factor 4 ($p = 0.61$), RABQ Factor 5 ($p = 0.69$), and RABQ Total ($p = 0.66$).

Correlation Between Coping Styles and Treatment Adherence

In the context of variable behaviors within the total sample, correlations were identified between coping strategies and adherence factors. Specifically, a positive and significant correlation was found between confrontational coping and the "Well-being Attitudes" ($\rho = 0.179^{**}$) and "Acceptance" ($\rho = 0.195^{**}$) factors of the RAAQ questionnaire. Likewise, positive and significant correlations were observed between confrontational coping and factors in the RABQ questionnaire, which pertain to "Adherence to Fluid Restrictions" ($\rho = 0.139^{*}$), "Self-care Adherence" ($\rho = 0.143^{*}$), and "Sodium Intake Adherence" ($\rho = 0.141^{*}$). It is concluded that higher confrontational coping scores are associated with higher scores in RAAQ factors 2 and 4 and RABQ factors 1 and 5 (Table 5).

Sustaining coping had positive and significant correlations with RAAQ factor 2, "Well-being Attitudes" ($\rho = 0.160^{*}$), RAAQ factor 3, "Attitudes Toward Self-care and Family Support" ($\rho = 0.179^{**}$), and RAAQ factor 4, "Acceptance" ($\rho = 0.167^{*}$). Additionally, weak but significant positive correlations were found between sustaining coping and RABQ factor 1, "Adherence to Fluid Restrictions" ($\rho = 0.134^{*}$), and RABQ factor 3, "Self-care" ($\rho = 0.185^{*}$). However, there was a weak

Table 5
Correlation between coping subtypes and factors of adherence scales

	Confrontive	Sustaining	Evasive	Fatalistic	Optimistic	Palliative	Emotional	Self-reliant
RAAQ F1	0.004	-0.044	-0.212**	-0.273**	-0.053	0.16	-0.260**	-0.024
RAAQ F2	0.179**	0.160*	-0.028	-0.052	0.092	0.100	-0.93	0.093
RAAQ F3	0.097	0.179**	0.120	0.161*	0.060	0.103	0.202**	0.036
RAAQ F4	0.195**	0.167*	-0.022	-0.119	0.069	0.121	-0.153*	0.106
RABQ F1	0.139*	0.134*	-0.012	-0.082	0.062	0.075	-0.136*	0.024
RABQ F2	-0.027	-0.029	-0.098	-0.198**	-0.085	-0.095	-0.059	-0.078
RABQ F3	0.143*	0.185*	-0.050	-0.017	0.138	0.23	-0.109	-0.048
RABQ F4	-0.089	-0.156*	-0.172*	-0.285**	-0.133	-0.126	-0.287**	-0.145*
RABQ F5	0.141*	0.070	0.230**	0.146*	0.104	0.063	0.095	0.0227**

Note: *: Significance level less than 0.05; **: Significance level less than 0.001. RAAQ F1: Attitudes toward social restrictions; RAAQ F2: Attitudes toward well-being; RAAQ F3: Attitudes toward self-care/support; RAAQ F4: Acceptance. RABQ F1: Adherence to fluid restriction; RABQ F2: Adherence to potassium and phosphorus restrictions and prescribed medication use; RABQ F3: Self-care; RABQ F4: Adherence in times of particular difficulty; RABQ F5: Adherence to sodium restrictions; RAAQ: Renal Adherence Attitudes Questionnaire; RABQ: Renal Adherence Behavior Questionnaire.

negative correlation with RABQ factor 4, "Adherence in Difficult Moments" (ρ = -0.156*). In summary, higher scores in sustaining coping are associated with higher scores in RAAQ factors 2, 3, and 4 and RABQ factors 1 and 3, and lower scores in RABQ factor 4.

Evasive coping demonstrated a weak yet significant negative correlation with RAAQ factor 1, "Attitudes Toward Social Restrictions" (ρ = -0.212**), and RABQ factor 4, "Adherence in Difficult Moments" (ρ = -0.172*). However, a significant positive correlation was found between evasive coping and RABQ factor 5, "Sodium Intake Adherence" (ρ = 0.230**). This suggests that higher evasive coping scores are associated with higher scores in RABQ factor 5 and lower scores in RAAQ factor 1 and RABQ factor 4.

Regarding fatalistic coping, it exhibited a weak yet significant negative correlation with RAAQ factor 1, "Attitudes Toward Social Restrictions" (ρ = -0.273**), RAAQ factor 2, "Adherence to Potassium, Phosphorus, and Medication Restrictions" (ρ = -0.198**), and RAAQ factor 4, "Adherence in Difficult Moments" (ρ = -0.285**). This indicates that higher scores in fatalistic coping are associated with lower scores in these mentioned factors. Additionally, there were weak yet significant positive correlations with RAAQ factor 3, "Attitudes Toward Self-care and Family Support" (ρ = 0.161*), and RABQ factor 5, "Sodium Intake Adherence" (ρ = 0.146*). Therefore, higher scores in fatalistic coping are associated with higher scores in these factors.

Emotion-focused coping displayed weak yet significant negative correlations with RAAQ factor 1, "Attitudes Toward Social Restrictions" (ρ = -0.260**), and RAAQ factor 4, "Acceptance" (ρ = -0.153*), as well as RABQ factor 1, "Adherence to Fluid Restrictions" (ρ = -0.136*), and RABQ factor 4, "Adherence in Difficult Moments" (ρ = -0.287**). Higher emotion-focused coping scores are associated with lower scores in these factors. However, a significant positive correlation was found with RAAQ factor 3, "Attitudes Toward Self-care and Family Support" (ρ = 0.202**), suggesting that higher emotion-focused coping scores are associated with higher scores in RAAQ factor 3.

Lastly, positive correlations were found between self-reliant coping scores and RABQ factor 5, "Sodium Intake Adherence" (ρ = 0.227**), and a negative correlation with RABQ factor 4, "Adherence in Difficult Moments" (ρ = -0.145*). Thus, higher self-reliant coping scores are associated with higher scores in RABQ factor 5 and lower scores in RABQ factor 4. It's noteworthy that the optimistic and palliative subtypes did not display significant correlations.

Discussion

Chronic Kidney Disease Patients' Coping Strategies

Emotion-focused coping emerged as the prevailing strategy among the patients. It is noteworthy that all eight subtypes of coping were identified, with some participants employing multiple strategies simultaneously, as different coping strategies can be utilized in response to specific stressful situations (Seidl et al., 2001). Among these various subtypes, the "optimistic" coping strategy prevailed, suggesting a tendency to downplay the significance of the problem and/or face it independently.

Chronic Kidney Disease Patients' Adherence

Patients with CKD demonstrated a positive attitude towards dietary and fluid restrictions and how these restrictions affect their lives. These findings emphasize that adherence is a multidetermined, dynamic process that involves shared responsibility between the healthcare team and the patient (Feijão & Melo, 2020; Polejack & Seidl, 2010). The guidance provided by healthcare professionals regarding the treatment is crucial, as it enables patients to positively adapt to their new lifestyle and the imposed restrictions, empowering them to take control of their treatment (Feijão et al., 2024).

The patients also exhibited a good level of adherence, as measured by the RABQ scale. This encompassed adherence to restrictions on phosphorus, potassium, sodium, fluid intake, and medication use, both in the overall index and in most of its individual factors, including adherence to fluid restrictions, self-care, and adherence during difficult times. However, a lower level of adherence was noted in two factors, suggesting that there are no procedures or methods that can guarantee the adoption of an adherence pattern deemed as adequate for each individual (Feijão & Melo, 2020; Polejack & Seidl, 2010).

Adherence to self-care recommendations might be linked to the central role of the patient in the management of their prescribed therapy. The lower adherence levels in difficult times highlights the importance of providing continuous and repetitive guidance throughout the treatment process, rather than just at the beginning, to reinforce these instructions when difficulties arise (Lins et al., 2018).

Comparative Analysis between Patients Undergoing Hemodialysis and Peritoneal Dialysis

Comparison of Coping Strategies Between Hemodialysis and Peritoneal Dialysis Patients

Patients undergoing PD exhibited higher scores in the self-reliant coping subtype, while patients on HD scored higher in all other subtypes of coping. High scores in self-reliant coping may be associated with a tendency to confront problems in an independent manner, without seeking help or support from others or available resources, indicating a stronger preservation of autonomy, which is consistent with other studies (Souza et al., 2018).

Peritoneal dialysis stands out as a modality that offers greater autonomy and independence, along with several benefits to patients, including a lower occurrence of adverse effects compared to HD. Patients on PD report greater personal fulfillment, fewer financial disruptions, and greater

convenience since it can be performed at home (Oliveira, 2016). PD patients also have better healthcare practices as they tend to attend medical appointments and undergo routine examinations (Oliveira et al., 2019). This indicates a higher degree of personal agency and autonomy concerning healthcare-related matters.

Comparison of Adherence Attitudes Between Hemodialysis and Peritoneal Dialysis Patients

Patients undergoing PD displayed higher scores in the factor related to attitudes toward social restrictions compared to HD patients. This suggests that PD patients have a less disrupted daily routine, leading to better social adaptation. They do not experience the same ambivalent feelings reported by HD patients, who perceive the dialysis machine as a life-saving necessity but also as a prison imposed by the disease (V. F. C. Santos et al., 2018).

Comparison of Adherence Behavior Between Hemodialysis and Peritoneal Dialysis Patients

No statistically significant differences were found in the behavior of patients regarding restrictions on phosphorus, potassium, sodium, fluid, and medication use, regardless of the dialysis modality. This suggests that, irrespective of the type of dialysis treatment, the treatment regimen can compromise and limit various aspects of a patient's life, including physical, psychological, social, family, and personal dimensions (Roxo & Barata, 2015). Specifically, in terms of adherence to medication, it is understood to be a multidimensional concept, influenced by sociocultural factors rather than solely determined by the therapeutic modality. This may explain the lack of significant adherence-related differences between the two groups being analyzed (J. B. Santos et al., 2018).

Correlation between Coping Strategies and Treatment Adherence

Two coping subtypes showed more significant associations with adherence factors: confrontive (RAAQ factors 2 and 4 of the and RABQ factors 1 and 5) and sustainable (RAAQ factors 2, 3, and 4 and RABQ factors 1 and 3). Positive correlations indicated that patients with higher scores in these coping subtypes exhibited better adherence attitudes and behaviors. These findings emphasize the importance of patient autonomy among those with significant confrontive coping, characterized by their tendency to confront and combat problems. It also highlights the significance of support networks and spirituality among individuals with considerable levels of sustainable coping, as they utilize various forms of support (personal, professional, and/or spiritual) to face problems (Cargnin et al., 2018; Castro et al., 2018; Guzzo et al., 2017; Oliveira, 2016; Siqueira et al., 2109).

Conversely, the emotion-focused coping subtype showed more negative correlations with adherence indicators, including attitudes toward social relationships, as well as acceptance and adherence behavior concerning fluid restrictions and difficulties. Negative correlations suggest that higher levels of emotion-focused coping is associated with poorer adherence attitudes and behaviors. Similarly, the evasive, fatalistic, and self-care subtypes also predominantly showed negative associations, indicating that higher scores in these coping subtypes are related to worse adherence attitudes and behaviors. Finally, the optimistic and palliative coping subtypes did not exhibit any associations with adherence indicators. These findings indicate that emotion-focused coping strategies (Emotion-Focused, Self-Care, Optimistic, and Palliative), which are primarily aimed at regulating emotional responses to stressors or problems and possibly leading to distancing

from the stress source, have fewer positive correlations with adherence factors, corroborating the literature, which indicates that these present poorer associations with health levels (Folkman & Lazarus, 1988; Seidl et al., 2001).

Conclusion

Patients with CKD experience numerous limitations during their treatment, necessitating the development of strategies to cope with significant life changes and enhance their therapeutic adherence. Given the multifaceted and dynamic nature of adherence and the involvement of various responsible parties, a continuous monitoring effort by healthcare teams becomes essential. Thus, it is crucial to expand research efforts aimed at improving adherence indicators, including attitudes toward social restrictions, well-being, self-care, family support, and acceptance of the disease and treatment, as well as adherence behavior regarding prescribed medications, self-care, and managing challenging situations.

This study observed the predominance of emotion-focused coping and the optimistic subtype, characterized by the use of positive thoughts in addressing problems. However, there was a lower frequency of sustainable coping strategies, which involve using different forms of support to tackle problems. Comparisons between different RRT modalities revealed that patients undergoing PD exhibited higher scores in only the self-reliant coping subtype, possibly indicating a stronger preservation of autonomy. In contrast, patients undergoing HD scored higher in all other subtypes.

Regarding treatment adherence, the participants showed a good level of adherence attitudes, indicating satisfactory social adaptation, physical well-being, the ability to enjoy the benefits of dietary restrictions, self-care, and family and friends' support in maintaining their diet. When comparing RRT modalities, PD patients had better scores related to attitudes toward social restrictions than HD patients, which may indicate improved social adaptation. This suggests that PD patients might be more involved in leisure and work-related activities.

Adherence behavior also appeared positive in most of the analyzed factors, including adherence to fluid restrictions, self-care, and adherence in difficult times. No statistically significant differences were found in adherence behavior between patients undergoing different dialysis modalities (HD or PD), indicating that the treatment similarly impacts various aspects of patients' lives, regardless of the modality.

In conclusion, the study identified associations between therapeutic modalities, coping strategies employed by individuals with CKD, and their level of adherence to dialysis treatment. Patients undergoing PD showed more favorable attitudes toward social restrictions, possibly because their treatments have less impact in this regard. Patients employing confrontive and sustainable coping strategies demonstrated better therapeutic adherence, while those using emotion-focused coping exhibited poorer adherence.

Like all scientific endeavors, this research, while theoretically consistent and a significant contribution to the field, has limitations. One limitation is related to the non-probabilistic sample collected within a single state, which prevents the generalization of the obtained data to services in other regions of Brazil. Nevertheless, the purpose of this study was to explore this reality and identify possible differences between groups and associations among the defined variables.

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